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Lophodermium puerense sp. nov. on needles of *Pinus yunnanensis* var. *tenuifolia* from southwest Yunnan

Cheng-Lin Hou[1*] & Meike Piepenbring[2]

houchenglincn@yahoo.com piepenbr@daad-alumni.de

[1]*College of Life Science, Capital Normal University Xisanhuanbeilu 105, Haidian, Beijing 100048, China*

[2]*Escuela de Biología, Universidad Autónoma de Chiriquí 0427, David, Chiriquí, Panamá*

Abstract — A new species, *Lophodermium puerense* on *Pinus yunnanensis* var. *tenuifolia* from Puer, southwest Yunnan is described. It is similar to *L. orientale* and *L. pini-pumilae* but differs by the shape of the ascomata, presence of lip cells, the incomplete hypodermal cells present in the covering stroma, and the host relationship.

Key words — endophyte, pine, *Rhytismatales*, taxonomy

Introduction

Species of *Lophodermium* Chevall. on needles of *Pinus* spp. are endophytic and some cause serous needle cast on *Pinus*, such as *L. seditiosum* Minter et al., and *L. confluens* Y.R. Lin et al. (Ganley et al. 2004, Lin et al. 1995, Minter 1981, Minter et al. 1978). The taxonomy of *Lophodermium* on needles of *Pinus* spp. has received much attention, especially after Minter's monographic work. (He et al. 1986, Hou et al. 1996, Hou & Piepenbring 2006, Lin & Tang 1988, Lin et al. 1993, Sokolski et al. 2004). In this paper, we describe a new species of *Lophodermium* on *Pinus yunnanensis* var. *tenuifolia* W.C. Cheng & Y.W. Law from Puer, Yunnan.

Materials and methods

Sections of different thickness of ascomata were made by hand using a razor blade. Microscopic preparations were made in water, Melzer's reagent, 5% KOH, or 0.1% (w/v) cotton blue in lactic acid. For observation of ascomatal outlines in vertical section, sections were mounted in lactic acid or cotton blue

* Author for correspondence

with pretreatment in water. Gelatinous sheaths surrounding ascospores and paraphyses were observed in water or cotton blue. Ascospore contents were drawn based on observations in water mounts. Measurements were made from 20 ascospores and asci for each specimen using material mounted in 5% KOH.

Taxonomy

Lophodermium puerense C.L. Hou & M. Piepenbr., **sp. nov.** FIGURES 1–5
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Ascomata 350–600 µm, orbicularia, subepidermalia; paraphyses filiformes; asci 70–115 × 10–14 µm, cylindrici; ascosporae 60–90 × 1–1.5 µm, cylindricae, filiformes.

ETYMOLOGY: *puerense*, referring to the city of Puer, close to where the fungus has been found.

HOLOTYPE. On needles of *Pinus yunnanensis* var. *tenuifolia* (*Pinaceae*), Puer, Yunnan, CHINA, alt. ca. 1700 m, 11 August. 2001, C. L. Hou, R. Kirschner and M. Piepenbring 204 (AAUF).

ASCOMATA mostly on the abaxial side of secondary needles. In surface view ascomata 350–600 µm, more or less orbicular, grey to dark grey, strongly raising above the surface of the substrate, opening by a single longitudinal split. Lips present, hyaline, often invisible from the surface, split extending along about 3/4 of the entire length of the ascomata, perimeter line inconspicuous. In median vertical section ascomata subepidermal, 170–210 µm deep, covering stroma up to 30–50 µm thick near the centre of the ascomata, thinner towards the edges and only extending along half to 2/3 the covering stroma, consisting of thick-walled textura angularis with cells of 3–5 µm diam., the first layer of hypodermal cells usually degraded, 2–4 incomplete hypodermal cells still present in the covering stroma. Lip cells hyaline, 10–25 × 3–4 µm, mostly with one septum. BASAL STROMA flat, poorly developed, invisible, with some brown hyphae invading into degraded host cells underneath the subhymenium. SUBHYMENIUM 8-10 µm thick, hyaline, composed of 2–3 layers of small pseudoparenchymatous cells. PARAPHYSES 100–125 × 1–1.5 µm, filiform, not branched, septate, swollen at the apex. ASCI ripening sequentially, 70–115 × 10–14 µm, cylindrical-clavate, short stalked, thin-walled, J–, acute at the apex, without circumapical thickening, 8-spored. ASCOSPORES fasciculate, 60–90 × 1–1.5 µm, hyaline, aseptate, with a 2–3 µm thick gelatinous sheath.

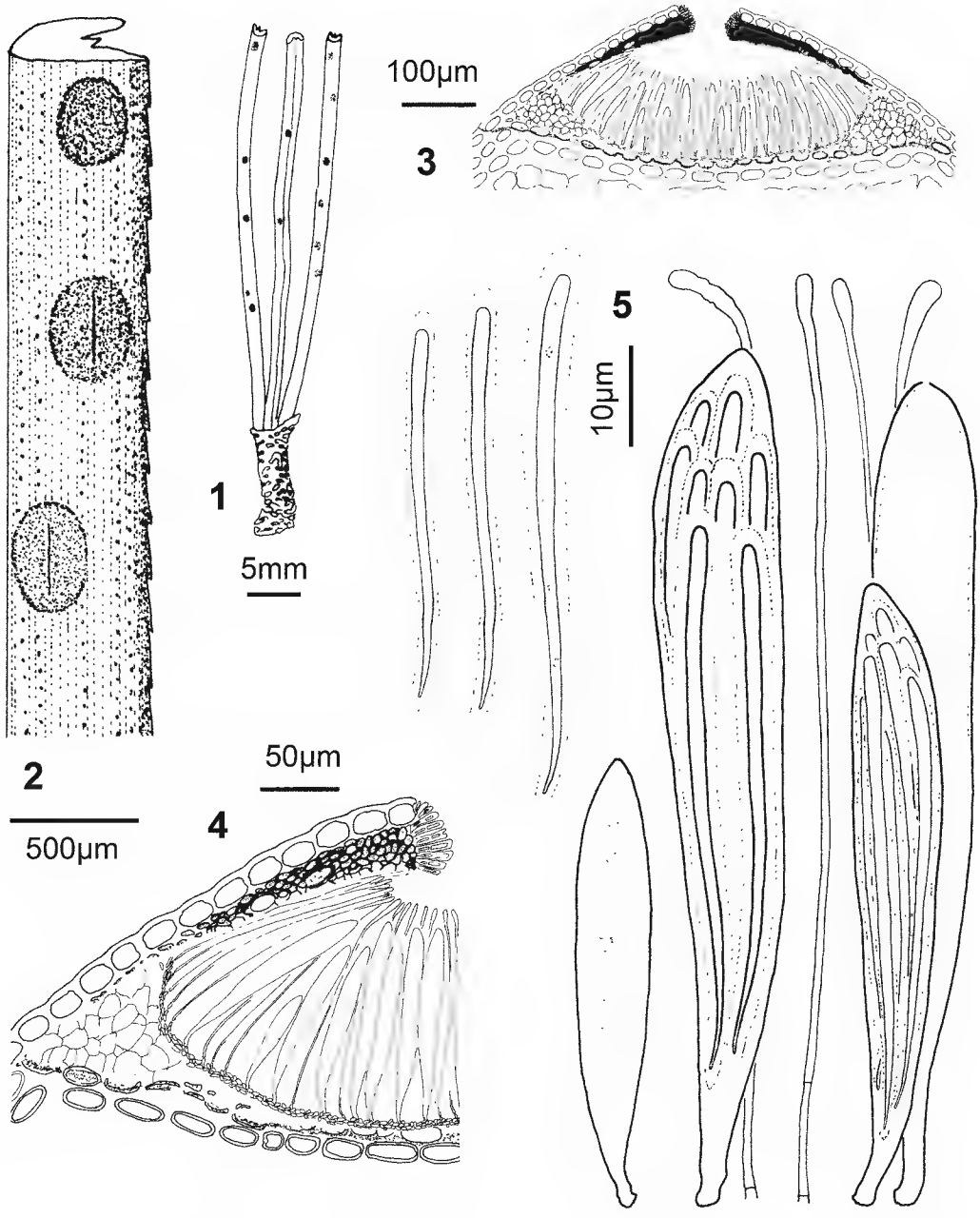
CONIDIOMATA not seen.

ZONE LINES not observed.

HABITAT: On needles that are still attached to twigs or fallen in litter.

DISTRIBUTION: *L. puerense* is known only from the type collection.

NOTES: By its subepidermal ascomata, *Lophodermium puerense* is somewhat similar to *L. orientale* Minter and *L. pini-pumilae* Sawada on five-needle pines



Figs 1–5. *Lophodermium puerense* on Pinus *yunnanensis* var. *tenuifolia*. 1. Needles bearing ascomata. 2. Ascomata observed under the dissecting microscope. 3. Ascoma in vertical section. 4. Detailed structure of an ascoma in vertical section. 5. Paraphyses, a young ascus, an ascus after the liberation of the ascospores, two mature asci with ascospores, and discharged ascospores.

(Minter 1981). However, *L. puerense* occurs on 2–3-needle pines and has conspicuous lip cells, while *L. orientale* and *L. pini-pumilae* lack lip cells. The shapes of ascomata differ among these three species. The ascomata are almost orbicular in *L. puerense*, while they are long elongate-elliptical in *L .pini-pumilae* and have a poorly marked, irregular outline in *L. orientale*. Furthermore, in *L. puerense* 2–4 incomplete hypodermal cells are present in the covering stroma.

L. puerense often occurs together with *L. conigenum* (Brunaud) Hilitzer on the same needles.

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